

## CLAIMS

What is claimed is:

- 5           1.     A modeling device for a simulation of complex dynamic systems, comprising:  
a plurality of remote agents, each remote agent comprising:  
logic to receive input data;  
object control node information corresponding to the performance of  
the remote agent and the relationship of the remote agent to the simulation;  
10           control instructions to convert the input data into the control node  
information; and  
logic to transmit the object control node information and the control  
instructions to a server computing device; and  
the server computing device, comprising:  
15           an object-based parallel modeling language component that collects  
object control node information and control instructions corresponding to each  
of the remote agents of the plurality of remote agents and coordinates the  
interaction of the remote agents based upon the collected object control node  
information and control instructions; and  
20           logic to transmit interactive simulation information based upon the  
coordination of the interaction of the remote agents to the plurality of remote  
agents.

2. The modeling device of claim 1, the server computing device further comprising:

modeling tools;

analysis tools; and

5 display tools.

3. The modeling device of claim 1, wherein the interactive simulation information is transmitted to a particular remote agent only if the simulation information of the particular remote agent is impacted by control node information and control instructions  
10 of a second remote agent.

4. The modeling device of claim 1, wherein the input information comprises:

input data; and

control instructions corresponding to the remote agent.

5. The modeling device of claim 1, the server further comprising:

a central control panel comprising:

a graphical display for viewing the simulation information.

6. The modeling device of claim 5, wherein the graphical display also displays input information and status data for a selected remote agent of the plurality of remote agents.

7. The modeling device of claim 5, the central control panel further comprising:

a plurality of user input devices for providing direct interaction with the  
object-based parallel modeling language component by enabling a user to input  
5 information and control instructions, both corresponding to a selected remote device.

8. A method of producing a coordinated and interactive simulation of a dynamic  
system, comprising the steps of:

defining a set of remote agents, wherein each remote agent performs the steps

10 of:

receiving input data;

transmitting the input data and control instructions relating to a  
corresponding remote agent of the set of remote agents to a server computing  
device; and

15 collecting the input data and control instructions from each of the remote  
agents of the plurality of remote agents at the server computing device;

coordinating the interaction of the remote agents at the server computing  
device based upon the input data and the control instructions, each set of control  
instructions corresponding to the set of control instructions of each remote agent of  
20 the plurality of remote agents; and

transmitting interactive simulation information based upon the coordination of the interaction of the remote agents from the server computing device to the plurality of remote agents.

5           9.     The simulation method of claim 8, the coordinating step comprising the steps of:

analyzing the input data corresponding to a particular remote agent based upon control instructions corresponding to the particular remote agent;

10           modeling the interactive simulation information based upon an interaction between the analyzed input data from the remote agents; and  
displaying a simulation based upon the interactive simulation information.

15           10.    The simulation method of claim 8, wherein the interactive simulation information is transmitted to a particular remote agent only if the simulation information for the particular remote agent is impacted by control node information and control instructions of a second remote agent.

20           11.    The simulation method of claim 8, further comprising the step of:  
defining sets of control instructions, each set of control instructions corresponding to a remote agent of the plurality of remote agents; and  
input to each particular remote agent the set of control instructions corresponding to the particular remote agent.

12. The simulation method of claim 8, further comprising the step of:  
displaying on a central control panel coupled to the server computing device a  
graphical display of the interactive simulation information.

5

13. The simulation method of claim 12, further comprising the step of:  
displaying on the central control panel input information and status data for a  
selected remote agent of the plurality of remote agents.

10

14. The simulation method of claim 12, further comprising the step of:  
entering input information and control instructions, both corresponding to a  
selected remote device, at the server computing device.